

**ABSTRACT OF THE DISCLOSURE**

An apparatus and method that allows the visualization of leakage of cell culture media through a conduit wall of a tissue-engineered biological construct such as a semilunar heart valve or valve graft under controlled physiologic conditions. The apparatus and method also allows for the assessment of valve function and intraluminal flow using conventional imaging modalities such as ultrasonic and magnetic resonance imaging. The apparatus allows the qualitative and quantitative evaluation of structural and functional characteristics of a condition tissue engineered construct prior to implantation using a valve housing and chamber and a flow-pressure simulator.

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